REMARKS

Applicant's counsel thanks the Examiner for the careful consideration given the application.

CLAIMS

Prior to the entry of this amendment, claims 20-38 were pending in the application.

Claim 20 has been amended. Clear support for the amendments can be found in the description (for example, page 6, equation (7); page 9, third paragraph; and page 8, third paragraph of the PCT application as published).

Also claims 21-22, 26-32 and 34-37 have been amended.

Original claim 38 has been deleted.

New claim 39 has been added.

Claim Objection

Claims 27, 28 have been amended to recite: [...] *equal to or greater than b and less than K, equal to or greater than K and less than B, equal to or greater than B.*

In claims 35, 36 the reference numerals have been deleted, so that the claim language does not refer back to the drawings.

Accordingly, the objections raised by the Examiner are felt to be overcome.

Claim Rejection - 35 USC § 112

Independent claims 20 and 35 have been amended to specify, respectively, that the procedure and the device according to the invention can determine an interest for entrustments of money. Such amendment is clearly supported by the description.

Applicant respectfully submits that the claims as amended cover some general features whose achievement is the calculation of such interest; the description does provide any necessary details for reduce in practice the invention and calculate the interest in practical cases.

In fact, starting from equations (1), (2) and (3), it is possible to determine the additional amount of money L; then as function of K, M, L, the interests i_F, i_M and i_L can be determined.

Finally, as a function of interests i_F, i_M, i_L and of B(K,M,L,λ), the required interest "i" can be obtained.

Claims 29 and 30 have been amended so that the expression "such as" is not present any more.

Claim Rejection - 35 USC § 101

Claim 20 has been amended to include some physical means through which the procedure is carried out.

Therefore, amended claim 20 does not cover a mere formula or mental act, but a technical process which is performed by a computer or electronic device.

The dependent claims have been amended accordingly, to further specify that the application seeks protection on a technical process and not on abstract ideas.

Moreover, Applicant respectfully submits that the procedure claimed in amended claim 20 achieves a useful, tangible and concrete result in the financial industry.

In particular, the invention achieves a useful result since it permits banks, and in general lenders, to prevent (or at least minimize) losses of money due to the fact that one or more borrowers do not completely pay back the loan received.

Further details are provided in the paragraph dedicated to §103 rejection.

The result achieved by the invention is also tangible since physical means by which to carry out the invention are clearly specified in amended claim 20.

As in re Warmerdam, the steps included in the procedure of claim 20 have been "fixed" in a tangible medium, i.e. the computer system which carries out the calculation.

Applicant respectfully submits that the "hypothesis" under which the invention works is merely the conditions in which the procedure/device according to the invention can obtain a reliable result.

The citation of "hypothesis" does not mean in any way that the invention refers to some abstract or non-tangible entities.

Any industrial processes work only under specific conditions; the same is true for the procedure and device according to the present invention.

The result achieved by the invention is also concrete, since such result can be assured and, given a certain set of input data, the result of the invention (obtained either through the procedure according to amended claim 20 or through the device according to amended claim 35) will always be the same.

Furthermore, Applicant respectfully submits that in *State Street Bank & Trust Co. V. Signature Financial Group, Inc.* 149 F.3d 1368 (Fed. Cir. 1998), 47 USPQ2d 1596, the Federal Circuit

decided that US Patent No. 5,193,056 was to be considered valid, and the subject matter claimed therein ("*a data processing system for managing a financial services configuration of a portfolio established as a partnership*") was to be considered patentable subject matter.

In particular the Court held that:

"*(...) the transformation of data, representing discrete dollar amounts, by a machine through a series of mathematical calculations into a final share price, constitutes a practical application of a mathematical algorithm, formula, or calculation, because it produces 'a useful, concrete and tangible result' -- a final share price momentarily fixed for recording and reporting purposes and even accepted and relied upon by regulatory authorities and in subsequent trades.*"

Moreover, Applicant respectfully submits that in *AT&T Corp. v. Excel Communications Marketing, Inc. and Excel Telecommunications, Inc.* 172 F.3d 1352 (Fed. Cir. 1999) the Court held that "*[b]ecause § 101 includes processes as a category of patentable subject matter, the judicially-defined proscription against patenting of a "mathematical algorithm," to the extent such a proscription still exists, is narrowly limited to mathematical algorithms in the abstract.*"

Also, in re *Appalat* 33 F.3d 1526, 31 USPQ2d 1545 (Fed.Cir.1994), it was stated that "*[The Court] never intended to create an overly broad, fourth category of [mathematical] subject matter excluded from § 101. Rather, at the core of the Court's analysis ... lies an attempt by the Court to explain a rather straightforward concept, namely, that certain types of mathematical subject matter, standing alone, represent nothing more than abstract ideas until reduced to some type of practical application, and thus that subject matter is not, in and of itself, entitled to patent protection.*"

In view of the above, it is clear that the procedure of amended claim 20 does fall into a category of patentable subject matter.

Finally, please note that also the subject matter of new claim 39 does fall into a category of patentable subject matter, since the application of the teachings of such claim in the field of financial industry achieves a useful, tangible and concrete result according to the above mentioned relevant case law, even if no physical limitations are introduced to specify the means through which the procedure is carried out.
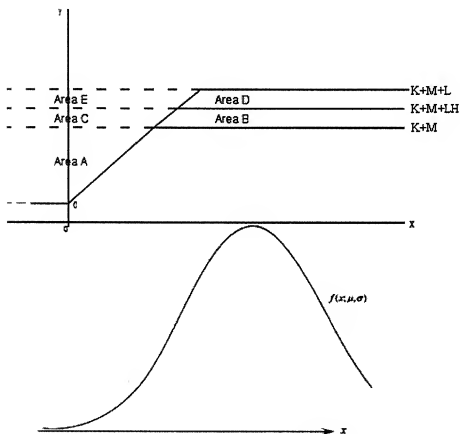
Claim 37 has been amended to include also a physical medium on which the software is stored. In Applicant's opinion now claim 37 is directed to statutory subject matter and the rejection raised by the Examiner is felt to be overcome.

Claim Rejection - 35 USC § 103

Amended claims 20 and 35 have been amended to further include that **L** is determined through an implicit equation.

Such additional feature allows a more precise and reliable calculation of the interest for entrustment of money.

In fact, the improvement over the state of the art provided by the features of amended claim 20 can be graphically explained referring to Graph 1 shown here below.

- Graph 1 -

The variable x refers to the future aleatory income of the borrower. Each x is a different possible state of the world, with f(x) probability of happening. In this graph, f(x) is supposed to be a continuous normal distribution, but as long as the criteria for the definition of probability density

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function are respected by f(x), any distribution that describes the future income of the borrower can be used.

As clearly states in the application, the lender seeks to receive the amount K+M, but in the region represented by Area "A", the borrower has no means to pay back the lender.

The relevant literature cited by both the Applicant and the Examiner explains that known procedures for dealing with this outcome include calculating the expected value of Area "A", and setting an additional markup LH equal to the expected value of Area "A", to be added to K+M.

Referring back to Graph 1, and taking into consideration that, by its same definition, the integral of the density function in the interval [–inf to +inf] is equal to 1, setting a markup equal to LH means that the expected values of Area "B" + Area "C" is equal to the expected value of Area "A".

Area "B" + Area "C" is the additional amount of money necessary for the lender to achieve a return of K+M. But Area "C" is never received by the lender because the borrower – just as with K+M – in those states of the world (x<K+M+LH) has no means to pay LH. Therefore by following the procedure described in the literature known at the time of the invention, the outcome of the lender would be always lower than expected, introducing a significant systematic error.

It is to be noted that such systematic error has always the same (negative) sign, so that in cases wherein a large number of loans is taken into consideration - such as the cases wherein the lender is a bank - all the errors sum up, creating one big cumulative loss of money.

Amended claims 20 and 35 solve this error in the procedure by setting L (expected value of Area "B" + Area "D") as the expected value of the sum of Area "A" + Area "C" + Area "E" – instead of the simple Area "A". This change in procedure allows the lender to receive back K+M, bringing a greater precision in the calculation of L and eliminating the negative bias found in the models presented in the past literature.

This implies that equation (3), as well as its equivalent equations (4), (5), (6), (7), (8), (10), (11), (13), becomes an implicit equation.

The analytical solution of equation (3) strictly depends on the existence of the integral of the chosen distribution function. If the integral of f(x) cannot be calculated either because it is unknown or because it does not exist, the sought parameter can always be found using numerical methods.

Therefore, L is defined through an implicit equation, which allows to precisely calculate the "additional amount of money" necessary to minimize the possible lender's losses.

A more precise calculation of parameter L increases the likelihood that the lender (such as, for example a bank) will recoup the lent money.

Taking into consideration the number of loans and the amount of money which are managed by a bank, it easy to figure out the advantage obtained by the solution claimed in amended claims 20 and 35 in terms of prevention of loss of money.

Not one of the cited prior documents discloses, teaches or suggests the calculation of L through an implicit equation.

Therefore amended claims 20 and 35 are novel and non-obvious over the prior art of record.

Dependent claims 21-34 and 36 include all of the limitations of respective independent claims 20 and 35. Thus the dependent claims are to be considered allowable as well.

Claims 37 and 38 include all of the limitations of amended claim 20 and therefore are to be considered allowable as well.

Conclusion

All matters having been addressed above and in view of the pending claims and remarks, Applicant respectfully requests the entry of this Amendment, the Examiner's reconsideration of the application, and the proper substantive examination of the pending claims in light of the prior art.

Applicants' counsel remains ready to assist the Examiner in any way to facilitate and expedite the prosecution of this application.

If any additional fees are required by this communication, please charge such fees to our Deposit Account No. 16-0820, Order No. BUG-40593.

Respectfully submitted,

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